A new species of the genus *Anetarca* Gosliner, 1991 (Gastropoda: Opistobranchia: Facelinidae) from the western Atlantic Ocean

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ABSTRACT

The genus *Anetarca* Gosliner, 1991, has been known as monotypic, with *A. armata* Gosliner, 1991, described from the Pacific coast of North America, as its type species. In this paper, a second species of the genus, *Anetarca brasiliana* new species, is described from the locality of Búzios, State of Rio de Janeiro (Brazil). It constitutes the first species of the genus found in the western Atlantic Ocean. The distinguishing characters of this species are the color pattern, the presence of lamellate rhinophores, and the penial duct provided with an apical elongate appendage.

INTRODUCTION

In 1991, Gosliner described the genus *Anetarca*, with the type species *A. armata*, belonging to the family Facelinidae, from the Pacific coast of central Baja California. The present paper describes a new species of *Anetarca* collected in Búzios (State of Rio de Janeiro, Brazil). It thus constitutes the second known species of that genus and the first species found in the Atlantic Ocean. MNCN stands for Nacional de Ciencias Naturales de Madrid, Spain, and MORG stands for Museu Oceanográfico "Prof. Eliézer de Carvalho Rios", Fundação Universidade do Rio Grande, Rio Grande, Brazil.

SYSTEMATICS

Genus *Anetarca* Gosliner, 1991

Anetarca brasiliana new species
(Figures 1–7)

Description:

External Anatomy (Figures 1–3): Body elongated. Foot broad and with elongated propodial tentacles. Rhinophores long, with 7–10 lamellae obliquely arranged. Lamellae connected by a longitudinal ridge on anterior and posterior faces of rhinophores. Rhinophores join at their bases. Eyes located behind bases of rhinophores. Oral tentacles considerably long, their length approximately half body size. Cerata cylindrical and slightly curved, cnidosac pointed. Precardiac cerata forming an arch containing a single row of cerata. Postcardiac cerata arranged in 9 clusters, each containing only a single row. Number of cerata per cluster in 7.5 mm specimen is: one precardiac arch with seven cerata and nine postcardiac rows with 4, 4, 4, 4, 3, 3, 2, 1, 1 cerata, respectively. Gonopore ventral to precardiac ceratal arch. Anus cleioproct, situated between first two postcardiac ceratal rows.

Coloration: General body and foot color translucent orange-brown with numerous white spots more or less densely concentrated, giving appearance of transverse white bands along dorsal surface of notum. Rhinophores and oral tentacles have same general color pattern, although apical third of rhinophores is almost translucent white, while on basal two-thirds orange-brown is more intense. In this portion borders of lamellae are red. Cerata have same superficial color pattern as body, with translucent-white cnidosac and dark-brown digestive diverticulum. Jaws visible externally and rose colored.

Internal Anatomy (Figures 4–11): Buccal apparatus with a series of oral glands on dorsal and lateral surfaces of its oral tube. Jaws rose colored, having a rather short masticatory border with irregular denticles (Figures 5, 8, 9). Radular formula in two of specimens, 7.5 and 8 mm long, is 12 × 0.1.0 and 16 × 0.1.0, respectively. Teeth arch-shaped, with broad and elongate central cusp and 9–11 elongate denticles on either side of cusp. Lateral denticles decrease in size toward margins (Figures 10, 11).

Reproductive System (Figures 6, 7): With narrow preampullar hermaphroditic duct. Duct connected to a broad and curved ampulla, which divides into a short oviduct and a narrow and coiled deferent duct. Oviduct

Figure 1. *Anetarca brasiliana.* Living holotype, MORG 40608, 9 mm length.

with a small seminal receptacle located anteriorly to junction with female gland mass. Deferent duct lacks a differentiated prostate. Penial papilla broad and curved. Penial duct shows narrow prolongation at its tip and a subterminal, curved and elongated chitinous stylet (Figure 7).

Biological Notes: When the animals are disturbed, the rhinophores bend forward and touch, crossing each another. In addition, the oral tentacles curve backward, bending around the rhinophores; the cephalic and precardiac region of the body move upwards. This display disappears when the molesting stimulus is removed.

Holotype: MORG 40608, 9 mm length, Francisco J. García and Jesús S. Troncoso colls., 24 Mar. 1998.

Paratypes: MORG 40609, paratype 1, from type locality, 6 mm length; MNCN 15.05/33182, paratypes 2 and 3, Praia dos Ossos, Armação dos Búzios, Brazil, 4 and 4.5 mm length respectively, Francisco J. García and Jesús S. Troncoso colls, 26 Mar. 1998.

Type Locality: Collected in the intertidal zone at Praia da Armação, Armação dos Búzios (State of Rio de Janeiro, Brazil).

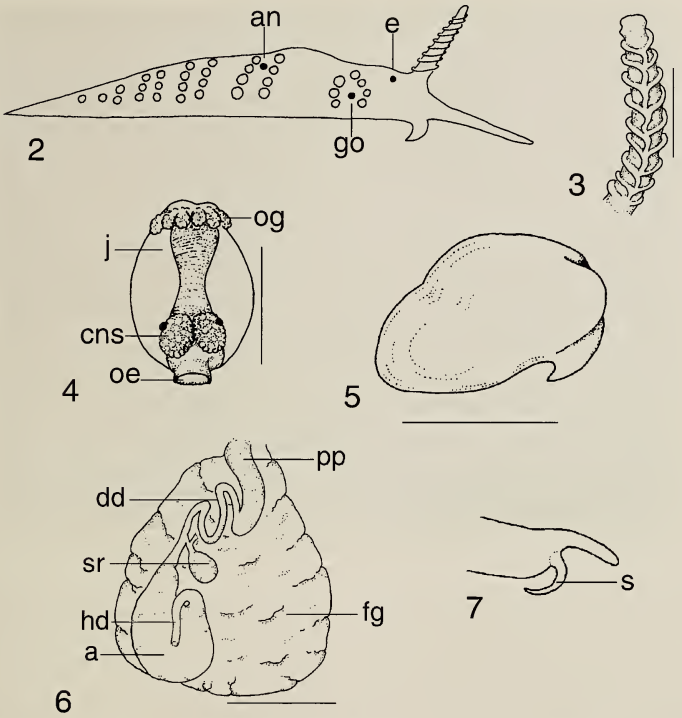
Other Material Examined: Two specimens, 7.5 and 8 mm in length, were collected in the intertidal zone at Praia da Armação, Armação dos Búzios (State of Rio de Janeiro, Brazil) (24 Mar. 1998), Francisco J. García and Jesús S. Troncoso colls.

Etymology: The name of this species, *brasiliana,* is dedicated to Brazil, the country where the specimens were collected.

DISCUSSION

Brazilian opisthobranchs and those from other western Atlantic areas were intensely studied for more than thirty years by Ernst and Eveline Marcus. However, the tropical western Atlantic opisthobranch fauna is not as well known as the Indo-Pacific fauna (Millen and Hamann, 1992) and that from the eastern Atlantic. Marcus (1977) published a checklist of the warm-water opisthobranchs found from La Plata (Argentina) to Cape Hatteras (USA), in which, eleven species of the family Facelinidae were cited. Posteriorly, Millen and Hamann (1992) described another species of this family from the Caribbean Sea, *Pauleo jubatus* Millen and Hamann, 1992. García and Troncoso recently (2003) named a species of *Phidiana* from Archipelago Fernando de Noronha (off northeastern Brazil). Eight species of Facelinidae have been cited from Brazilian waters, *Phydiana lynceus* Bergh, 1867, *Facelina coenda* Marcus, 1958, *Cratena pilata* (Gould, 1870), *Dondice occidentalis* (Engel, 1925), *Godiva rubrolineata* Edmunds, 1964, *Nanuca sebastiani* Marcus, 1957, *Favorinus auritulus* Marcus, 1955 (Marcus, 1977; Rios, 1994) and *Phidiana riosi* García and Troncoso, 2003.

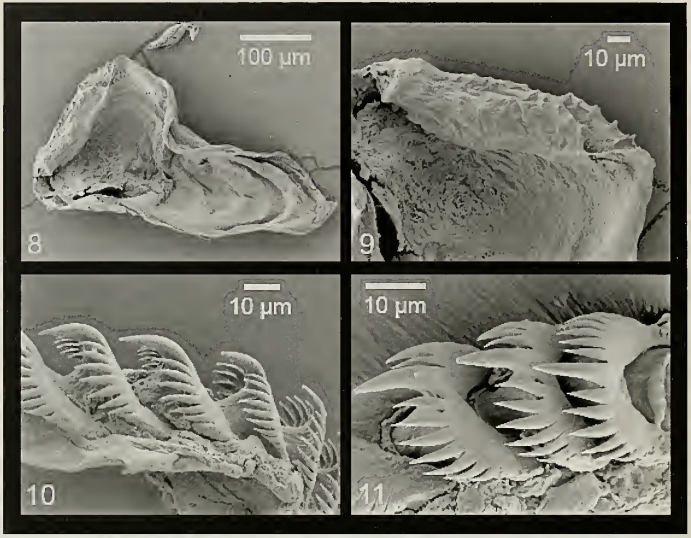
The species described in this paper differs externally from other facelinid species by the coloration and arrangement of cerata. In *Phydiana lynceus, Phydiana riosi,* and *Facelina. coenda* all cerata are arranged in rows (Marcus, 1958; Edmunds and Just, 1983; García and Troncoso, 2003); in *Dondice occidentalis* and *Godiva rubrolineata* the cerata are arranged in arches with more than one row of cerata per arch (Marcus, 1958; Edmunds, 1964); *Nanuca sebastiani* has only four groups



Figures 2–7. *Anetarca brasiliana*. **2.** Diagrammatic right profile showing the insertion of the cerata and position of the anus and reproductive apertures. **3.** Rhinophore. **4.** Dorsal view of the buccal apparatus. **5.** Jaw. **6.** Reproductive system. **7.** Detail of the penial duct. Abbreviations: a, ampulla; an, anus; cns, central nervous system; e, eye; dd, deferent duct; fg, female gland; go, genital opening; hd, hermaphroditic duct; j, jaw; oe, oesophagus; og, oral glands; pp, penial papilla; s, stylet; sr, seminal receptacle. Scale lines = 0.5 mm.

of cerata arising from a transversely set base (Marcus, 1957; Edmunds and Just, 1983); in *F. auritulus* the cerata are arranged in arches (Edmunds and Just, 1983) or the two first groups of cerata are arched and the hinder groups form simple rows (Marcus, 1955); finally, *Cratena pilata* has the first three groups arched and the three hinder ones forming oblique rows (Marcus, 1957). In addition, the rhinophores of our species differ from those of *F. auritulus* and *C. pilata*. In *F. auritulus*, the rhinophores are smooth and bear two bulbs (Marcus, 1955; Edmunds and Just, 1983); in *C. pilata* they are either covered with small tubercles (Marcus, 1957) or smooth (Marcus and Marcus, 1967). The penis is unarmed in all the Brazilian facelinid species except for *P. lynceus*, *P. riosi*, and *F. coenda*. *Phidiana lynceus* and *P. riosi* have a hook-shaped penial stylet (Marcus and Marcus, 1967; García and Troncoso, 2003) and in *F. coenda* the border of the penial leaf bears small protuberances prolonged into one to four brown spines (Marcus, 1958).

There are six other species of Facelinidae from the warm western Atlantic waters, *Palisa kristenseni* (Marcus, 1963), *P. papillata* Edmunds, 1964, *Learchis poica*



Figures 8–11. *Anetarca brasiliana.* Scanning electron micrographs. **8.** Jaw. **9.** Masticatory border. **10–11.** Radular teeth.

Marcus, 1960, *L. evelinae* Edmunds and Just, 1983, *Austraeolis catina* Marcus and Marcus, 1967, and *Pauleo jubatus* Millen and Hamann, 1992. Our species differs from both species of *Palisa* because in these species the rhinophores are covered with papillae, the radular teeth lack a prominent central cusp, and the penis is unarmed (Edmunds, 1964; Marcus and Marcus, 1970). *Austraeolis catina* has the three anterior groups of cerata arched and its penis ends on a disc whose edge is beset with ten broad warts, each bearing a tiny spine; there are two additional warts on the surface of the disc, also with spines (Marcus and Marcus, 1967). *Pauleo jubatus* differs from our species by the arrangement of the cerata groups in arches, the shape of the radular teeth, and the presence of a penial sac (Millen and Hamann, 1992). In the species of the genus *Learchis,* the post-pericardial groups of cerata are arched while the pre-pericardial ones form oblique rows; the penis is unarmed (Edmunds, 1964; Marcus and Marcus, 1970; Edmunds and Just, 1983).

Learchis poica Marcus and Marcus, 1960, is a variable Caribbean species. However, there are several anatomical features that allow us to differ *L. poica* from our specimens.

Learchis poica has the precardiac cerata arranged in 5–6 rows, and the postcardiac cerata form 6–7 arches (Marcus and Marcus, 1960; Edmunds and Just, 1983). In *Anetarca brasiliana* new species, the precardiac cerata form one arch and the postcardiac are arranged in 9 rows. The radular teeth of *L. poica* have a prominent cusp flanked by 5–8 denticles (Marcus and Marcus, 1960), while in *A. brasiliana* the radular teeth have 9–11 lateral denticles on each side of the central cusp. In addition, the deferent duct in *L. poica* is divided into a proximal narrow, not-glandular portion and a wide prostatic region that continues within the blunt penis (Marcus and Marcus, 1960); in *A. brasiliana* there is not a differentiated prostatic region of the vas deferent.

We have allocated the new species in the genus *Anetarca* Gosliner, 1991, because of the arrangement of cerata, with a pre-anal arch and single postanal rows, the shape of the radular teeth with a prominent central cusp, the male ducts lack a penial gland and the penis has a subterminal and curved penial spine.

Our specimens coincide with *Anetarca* in the features that characterize that genus, except the rhinophores, because in *A. armata* (the type species) the rhinophores are smooth while in our species they have oblique lamellae. Thus, we suggest that it should be allocated in the genus *Anetarca,* and that the generic definition be expanded to include species with smooth or lamellate rhinophores. A similar situation occurs in genus *Flabel-*

lina (Flabellinidae), which includes species with smooth, or ringed (annulate or perfoliate), or papillate rhinophores (Gosliner and Griffiths, 1981; Gosliner and Willan, 1991).

In addition to the ornamentation of the rhinophores, *A. brasiliana* differs externally from *A. armata* because in the former the oral tentacles are clearly longer than the rhinophores, while in *A. armata* they are shorter. Internally, *A. brasiliana* has the masticatory border of the jaws denticulated and the penial duct having an elongated apical appendage.

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